

**Looking at both sides of relationship dynamics in virtual communities:**

**A social exchange theoretical lens**

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# **Looking at both sides of relationship dynamics in virtual communities: A social exchange theoretical lens**

## **Abstract**

This study draws on social exchange theory to investigate the relationship dynamics of the member–community dyad in virtual community settings. Using a longitudinal design and multiple measurement sources, the findings indicate that social and task communication styles have unique effects on members' community commitment velocity, which in turn influences member gratitude and entitlement behaviors. A moderated path analysis demonstrates that the effects of social and task communication styles on community commitment velocity are both positively moderated by attachment anxiety and attachment avoidance. It also reveals that members' level of popularity augments the influence of community commitment velocity on member entitlement behavior.

**Keywords:** relationship velocity, entitlement behavior, attachment style, popularity, communication style, virtual community

## 1. Introduction

In today's digital world, virtual communities have become critical platforms in which people create, distribute, and share information with others [1–4]. Many well-known firms, including Harley-Davidson, Canon, and Nike, have developed and currently manage their virtual communities through various relationship-building efforts. These efforts, in turn, often lead to many positive outcomes, such as innovative idea generation, effective product concept pretests, and efficient customer service [5–7]. Therefore, information systems scholars have increasingly investigated the antecedents and consequences of member–community relationships [e.g., 8–11]. Although previous studies have made substantial contributions in this area, there are three aspects that warrant further attention.

First, previous studies have generally agreed that relationships are a fundamentally dynamic phenomenon [12–15]. However, there is little insight into the relative importance of the dynamic component of relationship as a driver of member behavioral outcomes in virtual communities, “thus losing time richness of explanation” [16, p.233]. Furthermore, Bateman, Gary and Butler [6, p.850] urge researchers to illuminate “the dynamic process of community formation” by conducting a longitudinal study. To respond to these calls, the current study employs a longitudinal research design and uses *community commitment velocity*, which reflects the rate and direction of change in commitment to account for the “developmental” and “path-dependent” nature of relationships [17, p.26]. We focus on commitment (i.e., an individual's enduring desire to maintain a valued relationship) because it represents “a psychological bond” that stabilizes community members' online behavior “under circumstances where the individual would otherwise be tempted to change that behavior,” [6, p.842] and is recognized as a central construct in the information systems literature [11,18,19].

Second, while previous research has demonstrated the different effects of communication styles on community members [20], few studies have empirically investigated how the social

and task communication styles influence the dynamic relational construct across different community members [21]. Communication styles are critical antecedents of members' commitment to their community, and have differing impacts on recipients' "cognitive, affective, and behavioral responses" [22, p.147]. Thus, it is important to simultaneously investigate the influences of social and task communication styles on community commitment velocity in virtual community settings. In addition, this study draws on attachment theory, part of the foundation of interpersonal relationships within the psychology literature, to examine two relationship-specific moderators of the link between communication styles and community commitment velocity relationships: attachment anxiety and attachment avoidance [23,24]. This investigation is essential because a communication style that is effective with one group might not be appropriate with another [25,26].

Third, a critical issue that remains controversial in the information systems literature is whether relational constructs have a significant impact on members' contribution behaviors. Wasko and Faraj [27] find little empirical support for a relationship between members' commitment and their community behaviors. By contrast, Wiertz and de Ruyter [18] report that members who are committed to their community contribute helpful knowledge more frequently. Other studies also report mixed results pertaining to the relationship between relational constructs and contribution behaviors [9,28–31]. These inconsistent findings may be attributed to the dark side of member–community relationships. More specifically, while community commitment velocity is associated with the bright side of relationship continuity, it may reveal a dark side in the form of threats to the relationship [32]. Yadav and Pavlou [33] argue that the investigation of the "dark side of social networking" offers opportunities to enrich theory related to virtual communities. In the current study, we examine both the bright and dark sides of community commitment velocity in the form of its potential effects on member gratitude and entitlement behaviors. Member gratitude is viewed as a contribution behavior motivated

by a felt obligation to reciprocate to the community, whereas member entitlement is a claimed behavior where members feel entitled to request extra effort from the community based on the belief that they deserve it [34]. We also test the moderating effect of members' level of popularity in their community on the relationship between community commitment velocity and member entitlement behavior.

This study addresses these identified gaps and makes three significant contributions to the information systems literature. First, we advance the understanding of relationship dynamics in the virtual community literature by introducing the construct of community commitment velocity. Drawing on the relationship dynamics perspective, this study captures dynamic trend information relevant to members' behavioral outcomes. Our longitudinal research design with multi-source data also reduces the risk of observed correlations reflecting same source or common method biases, and improves the value of the causal inferences from the data [35]. By adopting this approach, we answer the call to capture more precisely the complex and dynamic relationship between community commitment velocity and members' behavioral outcomes [27,28,36].

Second, we extend the virtual community literature by delineating a research framework that draws on social exchange theory to investigate the symbolic and functional benefits of communication styles and their effects on community commitment velocity. We also test whether attachment anxiety and attachment avoidance moderate the effects of social and task communication styles on community commitment velocity. This moderation test breaks new ground by evaluating whether the effectiveness of differing communication strategies is contingent on members' relationship-specific attachment styles [26,37].

Third, we add to the virtual community literature regarding the role of member–community relationships in driving unfavorable outcomes. While existing studies predominantly look at the bright side of member-community relationships, we integrate the

dark side in terms of how community commitment velocity simultaneously facilitates member gratitude and entitlement behaviors. Moreover, we examine the moderating effect of level of popularity on the relationship between community commitment velocity and member entitlement behavior, and thereby specify a boundary condition for predicting member entitlement behavior based on community commitment velocity.

## **2. Theoretical background**

### *2.1 Relationship dynamics*

Relationships are dynamic in nature [38]. They involve repeated interactions that track a path through development, maturity and decay [12,13,15]. This path is reflected in Palmatier et al.'s [17] theory of relationship dynamics, which integrates the dynamic component of a relational construct with the existing relationship management literature. The term "relationship dynamics" implies changes in relational constructs, such as satisfaction, trust, and commitment [39].

Following the existing information systems literature, this paper focuses on a particular relational construct, commitment, which is considered to be one of the most critical predictors of an individual's actions within the collective [6,40]. Commitment refers to an individual's enduring desire to maintain a valued relationship [37,41]. It reflects a community member's self-focused attitude facets regarding a relational exchange [42], and is the key to a successful long-term member–community relationship [37].

Palmatier et al. [17] conceptualize the relationship state (i.e., the precise description of a relationship at a specific point in time) by introducing *commitment velocity*. This construct reflects the rate and direction of change in commitment<sup>1</sup>, where rate represents the level of

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<sup>1</sup> Change in commitment differs from change in relationship quality. The former refers to the rate and direction of change in a member's enduring desire to maintain a valued relationship with a virtual community [17], while the latter is generally seen as a metaconstruct composed of several relational components that reflect the overall nature of a relationship, such as satisfaction, trust, and commitment [105]. In this paper, we particularly focus on

change, and direction indicates whether the commitment is growing or decaying [17, p.14]. Because relationships are evolving phenomena, commitment velocity can account for the developmental, path-dependent nature of relationships in virtual community contexts [43].

A significant body of research argues that individual decisions are mainly based on the potential value of gains and losses rather than final outcomes, and they evaluate these gains and losses using certain heuristics [44,45]. In virtual community settings, members with positive commitment velocity may expect that their relationship with the community will continue to grow. Thus, they perceive higher gains and lower losses in a way that stimulates them to contribute to their community [44]. In contrast, members who have the same level of commitment but perceive their relationship with the community as declining are less likely to make contributions [46].

## *2.2 Social exchange theory and relationship dynamics*

This study develops hypotheses pertaining to antecedents and outcomes of community commitment velocity and three key moderators in an attempt to complement and add to findings of recent studies [e.g., 6,33,47–49]. To do so, we adopt social exchange theory as an overarching theoretical lens to examine the proposed hypotheses. Four aspects of social exchange theory are highly relevant to the current research.

First, communication styles within a virtual community are important to the formation of member–community relationships [50–53]. Different communication styles are related to different psychological responses from community members [22]. Therefore, this study theoretically classifies social and task communication styles on the basis of their degree of concreteness [54]. According to social exchange theory, social and task communication styles signal different benefits to community members. A community with a high social

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change in commitment.

communication style provides symbolic benefits because it satisfies members' emotional needs [54]. In contrast, one with a high task communication style offers more concrete benefits due to the constant updates containing practical and helpful information for members [34].

Second, social exchange theory provides an explanation of why community commitment velocity generates desirable (i.e., member gratitude behavior) and undesirable (i.e., member entitlement behavior) outcomes [34,55]. According to this theory, community commitment velocity is likely to activate implicit governance norms or guidelines for exchange among community members [54]. It simultaneously triggers the reciprocity norm and the rank equilibrium norm. The reciprocity norm represents quid pro quo propensities [56,57]: a tendency to return positive treatment for positive treatment. Thus, community members with high commitment velocity tend to engage in gratitude behavior, such as continuance intention, knowledge contribution, and proactive engagement [19,58]. By contrast, the rank equilibrium norm suggests that community members feel entitled to request for help and support that is commensurate with their relative standing within the community [34,59], and may explain why community members feel legitimately entitled to make requests for help and support from their communities.

Third, social exchange theory suggests that the benefits people perceive from communities' relationship-building efforts are contingent on individual differences [54,56,60,61]. This implies that the effects of various communication styles on community commitment velocity may differ based on members' relational orientation.

Fourth, social exchange theory also highlights that norm activation may vary across contexts [54]. That is, community members' behavioral responses on the basis of their commitment velocity may depend on situational contexts. Drawing on these four aspects of social exchange theory, we summarize our conceptual framework in Figure 1.

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*Figure 1 about here*

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### **3. Hypotheses development**

In this section, we investigate how communication styles influence community commitment velocity, as well as how attachment anxiety and attachment avoidance act as moderators of these relationships. We then examine the influences of community commitment velocity on member gratitude and entitlement behaviors, and finally consider how the contextual factor of members' level of popularity moderates the relationship between community commitment velocity and member entitlement behavior.

#### *3.1 Communication styles and community commitment velocity*

The literature generally views social versus task communication styles as two different communication approaches [62–66]. The former focuses on “interpersonal relationships, satisfying emotional needs of recipients, and facilitating interactions,” while the latter focuses on “goals, exchanging knowledge, and fulfilling recipient needs in terms of information” [22, p.153].

These two communication styles represent symbolic and concrete benefits rooted in social exchange theory [54]. A social communication style symbolically signals to community members that they are viewed as an integral part of the community [67]. A task communication style signals, through the concreteness of information flows, the benefits of information exchange among community members. Consistent with research that indicates communication styles have positive effects on relationship formation [68,69], we expect both social and task communication styles will increase members' community commitment velocity.

A virtual community with a high social communication style is characterized by the presence of a virtual environment for social interaction. This environment makes community members feel comfortable communicating within the community and developing relationships with others [2,70], which in turn increases community commitment velocity [71]. A socially oriented virtual community also leads community members to experience a sense of enjoyment

[72], and again enhances community commitment velocity [54].

A virtual community with a high task communication style is characterized by the presence of various types of relevant and practical information. It provides community members with concrete benefits related to product and service knowledge. Previous research demonstrates that information quality relates to satisfaction [73]. When community members perceive information as highly relevant, it qualifies the expertise of the community in their minds, which in turn strengthens their intention to commit to a long-term relationship with the community [74]. Therefore, we hypothesize:

**Hypothesis 1:** A social communication style has a positive effect on members' community commitment velocity.

**Hypothesis 2:** A task communication style has a positive effect on members' community commitment velocity.

### *3.2 Moderation by attachment styles*

In a virtual community setting, members' relational expectations may affect how they react to their community's relationship-building efforts [54,60,75]. Consequently, we theorize that the positive relationship between task communication style and community commitment velocity will be more pronounced for a specific group of members [76]. To assess this prospect, we draw on attachment theory [23,24], which states that an attachment style is the systematic pattern of relational expectations based on an individual's internalization of a particular history of attachment experience [26,77,78]. Attachment styles are generally categorized into three patterns: secure, insecure-anxious (anxiety), and insecure-avoidant (avoidance) [79,80]. Attachment anxiety and attachment avoidance in particular are highly relevant to the relationship between task communication style and community commitment velocity [78,81].

Individuals develop multiple attachment styles over time, from general to relationship-specific ones [26,81]. Relationship-specific attachment styles may or may not be congruent

with the person's general attachment style [81]. Moreover, relationship-specific attachment styles are seen as stronger predictors of relational outcomes than general attachment styles [81,82]. As Klohnen et al. [82, p.1678] suggest, "researchers trying to predict outcomes within a specific relationship domain should measure individuals' corresponding attachment models to maximize their predictive ability and validity." In this study, we thus adapt the existing definitions of attachment anxiety and attachment avoidance to the virtual community context as follows: attachment anxiety refers to the extent to which a community member worries that other close community members might not be available in times of need, has an excessive need for approval, and fears rejection and abandonment [23,26]; attachment avoidance refers to the extent to which a community member has an excessive need for self-reliance, fears depending on others, distrusts community members' goodwill, and strives for emotional and cognitive distance from other members [26,83].

We expect the effect of task communication style on community commitment velocity will be stronger for members with high attachment anxiety. Anxiously attached members have low self-esteem and tend to view others as more knowledgeable [84,85]. Therefore, they are more likely to exaggerate the concrete benefits they receive from the community. When a community is highly informative, members with high attachment anxiety increasingly perceive that they obtain more useful information from the community [26]. As a result, those members hold inflated perceptions about the anticipated future benefits of the knowledge and information they can receive, and become particularly willing to quickly develop a relationship with their community [26,78]. By contrast, community members with low attachment anxiety tend to perceive themselves as positive [76,81], and attach less importance to the benefits provided by their community. Thus, the positive effect of task communication style on community commitment velocity may diminish.

Overall, we postulate attachment anxiety amplifies the impact of a task communication

style on community commitment velocity. The higher the attachment anxiety a community member has, the higher the concrete benefits they may perceive, and the higher community the commitment velocity that may ultimately stem from the task communication style. Thus, we hypothesize:

**Hypothesis 3:** The impact of a task communication style on community commitment velocity is stronger for community members with higher attachment anxiety than for those with lower attachment anxiety.

Attachment avoidance can be considered as the extent to which a community member maximizes physical, emotional, and cognitive distance from others in the virtual community setting [86]. Highly avoidant members eschew intimate online relationships with other members due to their low extraversion [77,87]. In turn, they are more likely to appreciate a task-oriented community, because they gain access to wide-ranging practical information that does not require frequent personal interactions with other members. In other words, members with high attachment avoidance value the concrete benefits (i.e., practical information provided by a community rather than via personal networks in a community) to a greater extent than those with low attachment avoidance, which in turn strengthens the relationship between task communication style and community commitment velocity.

Conversely, the effect of task communication style on community commitment velocity may dwindle when community members have low attachment avoidance. Low avoidant members tend to establish close relationships with other community members due to their high extraversion, and are better able to obtain practical and updated information through their personal networks in addition to the information published in the community [87]. As such, they are less likely to value the concrete benefits that a task communication style delivers than highly avoidant members. These arguments suggest the following hypothesis:

**Hypothesis 4:** The impact of a task communication style on community commitment velocity

is stronger for community members with higher attachment avoidance than for those with lower attachment avoidance.

### *3.3 Community commitment velocity, member gratitude behavior, and member entitlement behavior*

According to social exchange theory, community commitment velocity is likely to simultaneously activate reciprocity and rank equilibrium norms [54,59]: the former relates to member gratitude behavior, while the latter is associated with member entitlement behavior. Extending Wetzel et al.'s [34] conceptualization of gratitude and entitlement behavior to the virtual community context, we consider member gratitude behavior as a contribution behavior motivated by a felt obligation to reciprocate to the community, whereas member entitlement behavior refers to a claimed behavior that members feel entitled to request extra effort from the community based on the belief that they deserve it.

High community commitment velocity suggests that community members feel an elevated level of reciprocity norms, and an enhanced sense that they should repay their community through knowledge contribution. Chen and Hung [16] find that the norm of reciprocity positively influences knowledge contribution behavior. Moreover, community members with strong reciprocity tend to share high quality information with other members [9,10,88]. Hence, we hypothesize:

**Hypothesis 5:** Community commitment velocity has a positive effect on member gratitude behavior.

When considering the role of community commitment velocity in facilitating member entitlement behavior, we note available evidence demonstrating the relevance of rank equilibrium norm and member entitlement behavior. Bhattacharya and Sen [89] find that customers legitimate their claims on a firm when identifying with that company. Magee and Galinsky [90] demonstrate that rank equilibrium norm creates rank-induced expectations,

which eventually transform into undesirable behaviors. Wetzel et al. [34] also show that customers who receive prioritization treatment believe that they are entitled to demand additional efforts from the service provider. Based on these arguments, we hypothesize:

**Hypothesis 6:** Community commitment velocity has a positive effect on member entitlement behavior.

### *3.4 Moderation by level of popularity*

Community members' perception of rank equilibrium norm varies across contexts [54]. Therefore, the effect of community commitment velocity on member entitlement behavior may be contingent on contextual factors. To assess this prospect, we use members' level of popularity as a moderator. Community members with high popularity are likely to be seen as experts in their community and thus become opinion leaders [91,92]. As popular and influential members, their rank equilibrium norm could be activated because they perceive themselves as holding higher status than other members [93]. This suggests that highly popular members should exhibit relatively stronger linkages from community commitment velocity to member entitlement behavior. By contrast, members with low popularity are less likely to activate their rank equilibrium norm, and less likely to assume they are entitled to claim help and support from other community members, even though they have a high community commitment velocity. Therefore, we hypothesize:

**Hypothesis 7:** The impact of community commitment velocity on member entitlement behavior is stronger for community members with higher popularity than for those with lower popularity.

## **4. Research method**

### *4.1 Sample, setting, and procedures*

Five Taiwan-based virtual communities were selected to test our proposed theoretical

model: three luxury camera-based communities with around 20,000 registered members, and two luxury car-based communities with around 60,000 members. These types of virtual communities (e.g., knowledge-sharing communities on 3C and engineering topics) have been successfully used by other researchers [18,28]. To become a member of these communities, a user must register by choosing a unique name and password, and provide a working email address.

Initially, these communities were a place for sharing luxury product information on cameras and cars. Over time, they gradually became discussion forums where community members share information about product usage experience, restaurant recommendations, tourism, and other life experience. These communities provide a user-friendly interface that allows members to review, share, and reply to articles as well as upload photos. All member-generated information is visible to every other member in real time.

We designed a longitudinal study that included the combination of both self-reported and objective data (see Table 1). This approach is less susceptible to common method bias and offers greater potential for causal inferences [94]. At the start (Time 1), we used a survey to gather information on the participants' communication style and attachment style. One month later (Time 2), we employed a second survey to assess those participants' community commitment velocity and behavioral outcomes. Finally, we obtained data about the average number of views of the community members' three latest articles to measure their popularity level.

We obtained permission from the community platform executive officers before starting the study. To encourage respondents to complete both waves of the survey, we offered a shopping voucher valued at approximately seven US dollars on receipt of both surveys. An invitation to participate was published within each virtual community. Members accessed the online survey through a provided hyperlink. A total of 569 members completed the first wave

of the survey, and 414 members completed both waves. Of the 414 respondents, the vast majority was male (95%) with an average age of 35.5 years. According to interviews with community platform executive officers, their official member databases show that more than 90% of their members are male. The respondents were generally well educated (i.e., approximately 90% had obtained a college degree or higher).

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*Table 1 about here*

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#### *4.2 Measures*

Table 2 provides a detailed summary of the multiple-item measurement scales. The questionnaire used in this study was translated from English into Chinese by a professor specializing in information systems and a marketing doctoral student. Two other doctoral students then independently back-translated the questionnaire into English to verify its accuracy. Finally, three bilingual English-Chinese speakers compared the original and back-translated versions for semantic equivalence and refined the survey items as necessary.

We measured all constructs using seven-point Likert-type scales (i.e., 1 = *strongly disagree*, and 7 = *strongly agree*). We drew the measures for social and task communication styles from Dabholkar et al. [22], who originally used these measures to check the manipulation of their experiment in an online group chat context. Following their measures and referring to other literature on communication style [20,95], we further developed new measures for task and social communication styles in the virtual community context that show high internal consistency. The measure of attachment anxiety and attachment avoidance was adapted from Mende et al. [26]. A three-item measure adapted from Palmatier et al. [17] was used to measure community commitment velocity. To measure member gratitude behavior and member entitlement behavior, we used a multiple-item scale adapted from Wetzel et al. [34].

To measure the level of popularity, we referred to relevant studies [93,96] and used ‘the average number of views of a community member’s three latest articles’ as a proxy for

popularity. Prior studies measured popularity in different ways. For example, Zhu and Zhang [96] assessed product popularity by the total number of reviews of a product, whereas Goes et al. [93] measured user popularity by the number of followers or subscribers. The commonality between these studies is that they evaluated the level of popularity based on the exposure effect of popularity. As our research context is somewhat different from that of prior studies, we adapted previous studies' operationalization of popularity to fit our context and measured this construct objectively. Through counting the average number of views of a community member's three latest articles, we could capture the exposure effect of popularity, because the number of views for the latest articles is highly related to the number of viewers that a community member currently has. To reduce skewness, we used a logarithmic transformation of the number of views of the three articles, and then averaged these to form a single indicator. Community commitment level, age, gender, education level, and community type were also included in our conceptual model as control variables.

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*Table 2 about here*

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## **5. Results**

We adopted Anderson and Gerbing's [97] comprehensive, two-step approach to test our models (see Figure 1). We used a confirmatory factor analysis to assess the measurement properties of the reflective latent constructs and then performed structural equation modeling to test the research hypotheses. We tested all models with the support of LISREL 8.80 software. To assess the goodness of fit, we used chi-square tests, the root mean square error of approximation (RMSEA), standardized root mean square residual (SRMR), non-normed fit index (NNFI), and comparative fit index (CFI) [98]. A satisfactory model fit required nonsignificant chi-square tests and RMSEA values less than or equal to 0.08, and NNFI and CFI equal to or greater than 0.90.

### *5.1 Measurement model evaluation*

*Item reliability.* The standard used to measure items followed Bagozzi and Yi [99] in mandating that the factor loadings for each observed item of all latent constructs should exceed 0.50. All results obtained in the model were significantly higher than this criterion ( $p < 0.001$ ).

*Internal consistency.* We used two measures to evaluate the internal consistency of the constructs: composite reliability (CR) and average variance extracted (AVE). When the CR coefficient and AVE estimates exceed 0.60 and 0.50, respectively, this indicates an adequate level of internal consistency [99]. As Table 2 shows, the CRs ranged from 0.82 to 0.95, and the AVEs ranged from 0.55 to 0.87. Hence, all constructs exhibit a good level of internal consistency.

*Discriminant validity.* Three different approaches were used to evaluate the discriminant validity of model constructs. First, a confirmatory factor analysis, with six latent constructs and 22 measures, revealed that the model fits the data well ( $\chi^2(194) = 621.12, p \approx 0.00$ ; RMSEA = 0.073; NNFI = 0.98; and CFI = 0.98). None of the 95% confidence intervals for each correlation coefficient included the value of 1, providing strong evidence of discriminant validity. Second, as shown in Table 3, the diagonal elements (square roots of the AVE for each construct) exceeded the off-diagonal elements, indicating that each construct shared more variance with its measures than with other constructs [100]. These results suggest that all measures of the constructs in the measurement model exhibited adequate discriminant validity. Third, we examined the discriminant validity of the measures using chi-square difference tests. Under these tests, the correlations of all possible pairs of constructs were first, freely estimated, and then, constrained to equal 1. We checked whether the constraint caused a significant degradation in fit. These tests revealed factor pairs as distinct in all cases, and, again, offers evidence of discriminant validity for all construct measures (see the Appendix).

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*Table 3 about here*

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## *5.2 Structural model estimation*

The fit statistics for the full sample model ( $\chi^2(268) = 1026.74, p \approx 0.00$ ; NNFI = 0.96; CFI = 0.96; RMSEA = 0.079) demonstrate that the hypothesized model offers a good representation of structures that underlie the observed data. We found significant support for the paths from social communication style and task communication style to community commitment velocity (see Figure 2), with gamma coefficients of 0.33 ( $p < 0.01$ ) and 0.34 ( $p < 0.01$ ), respectively, thereby providing support for H1 and H2. We also found a positive and significant relationship between community commitment velocity and member gratitude behavior ( $\beta = 0.24, p < 0.01$ ) that supports H5. Finally, as expected, community commitment velocity had a positive and significant effect on member entitlement behavior ( $\beta = 0.21, p < 0.01$ ), in support of H6. These antecedents explain over half (55%) of member gratitude behavior and about one-sixth of member entitlement behavior (15%).

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*Figure 2 about here*

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### 5.3 Tests of mediation

To confirm the model's validity, we performed four formal tests of mediation on the paths from the antecedents of community commitment velocity to member gratitude and member entitlement behavior, to reveal whether additional direct paths not specified in the model are significant. For example, to confirm whether the direct path from social communication style to member gratitude behavior is significant, we compared our proposed model (Figure 1) with a model that contains an additional path from social communication style to member gratitude behavior. As the difference is not significant ( $p > 0.26$ ), we can conclude that this direct path is insignificant. That is, community commitment velocity fully mediates the effects of social and task communication styles on members' behavioral outcomes. As Table 4 shows, of the four tests of rival hypotheses for the direct effects, none of the paths are significant, supporting the robustness of our proposed model.

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*Table 4 about here*

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#### *5.4 Moderating influences of attachment style and level of popularity*

To test the hypotheses pertaining to the moderating effects, we conducted multiple group analyses [101], with a median split to separate the groups according to the scores of moderators. The moderation tests of H3, H4, and H7 can identify any differences in the respective coefficients of the hypothesized paths. For example, in the baseline model, the effect of task communication style on community commitment velocity can vary across groups; in the second model, we constrained the effect to be equal across subsamples. A model in which the equality constraint fits the data significantly worse than the baseline model suggests the presence of a moderating effect.

Table 5 summarizes the results of the moderation analyses. The path from task communication style to community commitment velocity is stronger for the subsample with higher attachment anxiety ( $\gamma = 0.68, p < 0.01$ ) than for the subsample with lower attachment anxiety ( $\gamma = 0.15, p < 0.01$ ). This supports H3 ( $\Delta\chi^2 = 10.78, \Delta df = 1, p < 0.01$ ). The path from task communication style to community commitment velocity is also significantly different for the higher ( $\gamma = 0.61, p < 0.01$ ) versus lower ( $\gamma = 0.06, p < 0.05$ ) attachment avoidance groups, supporting H4 ( $\Delta\chi^2 = 12.16, \Delta df = 1, p < 0.01$ ).

For H7, consistent with the predicted strength of the path from community commitment velocity to member entitlement behavior, the results show that the link is stronger for community members with higher ( $\beta = 0.55, p < 0.01$ ) versus lower popularity ( $\beta = 0.07, p > 0.05$ ). The path for the high- versus low-popularity groups is also significant ( $\Delta\chi^2 = 4.56, \Delta df = 1, p < 0.05$ ). Thus, H7 is supported.

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*Table 5 about here*

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### 5.5 Post hoc exploration of potential moderating effects<sup>2</sup>

We conducted post hoc analyses to explore whether the relationship between the social communication style and community commitment velocity is moderated by attachment anxiety and attachment avoidance. Following the aforementioned multiple group analyses [101], the results show that the path from social communication style to community commitment velocity is stronger for the subsample with higher attachment anxiety ( $\gamma = 0.66, p < 0.01$ ) than for the subsample with lower attachment anxiety ( $\gamma = 0.18, p < 0.01$ ). This indicates that attachment anxiety positively influences the social communication style—community commitment velocity linkage ( $\Delta\chi^2 = 25.82, \Delta df = 1, p < 0.01$ ). Highly anxious community members may exaggerate the social benefits they receive from others because of their low self-esteem.

The results also show that the linkage between social communication style and community commitment velocity is stronger for community members with higher ( $\gamma = 0.38, p < 0.01$ ), versus lower attachment avoidance ( $\gamma = 0.14, p < 0.01$ ), with positively significant support ( $\Delta\chi^2 = 6.88, \Delta df = 1, p < 0.05$ ). This finding is counterintuitive because avoidant people tend to strive for emotional, cognitive and physical distance from others, and fear depending on others [26,81]. Thus, the social communication style should have no significant effect, or even a negative effect, on community commitment velocity when an individual is highly avoidant. This counterintuitive finding may be attributed to the nature of member–community online relationships. In contrast to more traditional personal relationships, member–community relationships are less intense, as well as more distant and flexible. Therefore, members with high attachment avoidance may enjoy the associated social benefits without fearing dependence on others.

## 6. Discussion

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<sup>2</sup> We thank the associate editor and the anonymous reviewers for their helpful suggestions that expanded our examination of the potential moderating effects.

This study enhances our understanding of relationship dynamics in virtual community settings. Using social exchange theory as a theoretical lens, the longitudinal and multi-source data show that the social communication style and task communication style help trigger community commitment velocity, which elicits member gratitude and entitlement behaviors. Attachment style and level of popularity act as boundary conditions for the influences of communication style on members' behavioral outcomes. These results suggest several theoretical and managerial implications.

### *6.1 Theoretical implications*

This study makes three distinct contributions to the extant information systems literature. First, we develop and test a theoretical model that uniquely integrates social exchange theory and relationship dynamics to explain members' behavior in virtual community contexts. Most studies investigate member–community relationships from a static perspective [9,28,88]. Very few consider the dynamic perspective [6,16,36]. Drawing on substantive theoretical perspectives, we argue that members' behavioral outcomes are best understood by treating relational constructs as a dynamic concept [17,39,43]. The current study therefore extends past findings and provides new directions for future research by introducing the concept of relationship dynamics to the information systems field [5,6,9,88].

Second, our study reveals that social and task communication styles make unique contributions to members' gratitude and entitlement behaviors through community commitment velocity. Researchers demonstrate that different communication strategies may change member–community relationships [21,62,63]. There has been, however, no concerted effort to link these communication strategies with dynamic relational constructs in virtual community contexts. Extending existing virtual community research, the current study confirms the pivotal role of community commitment velocity in linking communication strategies to member behavioral outcomes. In support of social exchange theory [54], our

findings show that when members' community commitment level is controlled for, social and task communication styles positively relate to increases in community commitment velocity, which in turn contribute to member gratitude and entitlement behaviors. In other words, the effects of social and task communication styles, when considered simultaneously, are distinct in terms of their influences on community commitment velocity and (indirectly) on members' behavioral outcomes. In addition, our study demonstrates that the effects of social and task communication styles on community commitment velocity are contingent on members' attachment style. In particular, the results show that community members' reactions to communication styles are governed by attachment anxiety and attachment avoidance. The effects of social and task communication styles on community commitment velocity are stronger when community members have higher attachment anxiety or higher attachment avoidance.

Finally, our study extends the information systems literature by connecting community commitment velocity with both the bright and dark sides of member behaviors in a unified theoretical framework. Although scholars have called for greater understanding of "the dark side of social networking" [33, p.32], there is little research on the negative behavioral outcomes of community commitment velocity in virtual community settings. In response, the current study draws on social exchange theory to investigate the negative impact of community commitment velocity on members' behavioral outcomes. The results show that community commitment velocity is a double-edged sword: it not only triggers member gratitude behavior but also induces member entitlement behavior. This finding is important because previous studies have tended to focus on linking relational constructs to positive outcomes [5,88,102]. In addition, we find that members' level of popularity strengthens the association between community commitment velocity and member entitlement behavior. This result implies that a community member with high commitment velocity exhibits high levels of entitlement

behavior according to the extent to which he or she is popular within the community. Studies have begun to investigate the effects of popularity on online consumer behaviors [93,96]. Little research, however, has addressed the possibility that popularity acts as a moderator in the relational constructs–member behavioral outcomes linkage. Our study demonstrates that popularity is an important catalyst that strengthens the relationship between community commitment velocity and member entitlement behavior.

### *6.2 Managerial implications*

This study provides three practical insights for practitioners. First, social and task communication styles are common practices for community cultivators to develop relationships with members [22,103]. Many cultivators socialize with new members and actively provide specific information to them. However, these approaches might not always succeed if the main objective is to develop long-term member–community relationships. Our results show that the influences of communication styles on community commitment velocity are largely dependent on members’ attachment style. Thus, it is important for community cultivators to understand members’ attachment style before designing and implementing communication strategies. One possible approach to measure attachment style is to send a short survey to a particular group of members (e.g., newcomers) and offer virtual gifts upon completion. Another approach is to add several items to the community tasks (e.g., publishing an article, navigating to a particular page, or adding one community member as a friend) that community cultivators often use to help members familiarize themselves with and interact with their virtual communities. Members can accumulate points by completing each task and can exchange them for virtual gifts. Once community cultivators know the attachment style of a specific group of members (e.g., high attachment anxiety or high attachment avoidance), they can use social and task communication styles to develop relationships with these members. On the other hand, cultivators will likely need to consider other relationship-building mechanisms

for members who are low in attachment anxiety and attachment avoidance.

Second, our findings suggest that community cultivators should pay more attention to members' community commitment velocity, as it can provide critical and relevant information. For example, community members with high commitment tend to frequently contribute knowledge to their community. If their relationship with the community degrades, they might reduce their interactions with this community in the future, even as they maintain high commitment.

Finally, the results suggest that community commitment velocity is a double-edged sword. Members with high commitment velocity are likely to contribute their knowledge because they feel they should "pay back" their community [9,16,88]. Yet, high commitment velocity induces member entitlement behavior, under which members feel entitled to request extra effort from their community based on the belief that they deserve it [34]. Our findings demonstrate that this negative effect is amplified in the case of popular members. Hence, we recommend that community cultivators pay more attention to popular members to reduce the negative impact of their entitlement behaviors.

### *6.3 Limitations and directions for future research*

This study contains several limitations that suggest fruitful avenues for additional research. First, we collected data from similar community platforms, which may limit the generalizability of the results. Moreover, the majority of our respondents across the five virtual communities were males. Future researchers might obtain richer insights by conducting empirical investigations in different types of virtual communities that exhibit a more equal gender distribution, such as transactional online communities [104].<sup>3</sup> Second, we did not include platform characteristics, such as ease of use, system reliability or perceived control in

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<sup>3</sup> We thank the associate editor and the anonymous reviewers for pointing out this limitation and providing insightful directions for future research in this area.

our study [e.g., 70]. These platform characteristics may be important antecedents of community commitment velocity. Future researchers could extend our study by exploring the relevant effects. Third, future researchers might assess the role of attachment style in other virtual community settings, as it appears to be an important boundary condition with respect to the influence of member relationship management strategies on relationship development. An interesting empirical question is whether the effects of platform characteristics on relational constructs are contingent on members' attachment style. Fourth, as the first study on the dark side of community commitment velocity in virtual community contexts, we find that community commitment velocity encourages member entitlement behavior. This remains an intriguing area for researchers to explore, especially with respect to its unintended consequences. Fifth, although our findings suggest that the level of popularity strengthens the association between community commitment velocity and member entitlement behavior, we did not attempt to investigate potential buffering factors that might mitigate this negative consequence. Exploring other contingency factors would yield useful insights and offer practical suggestions for community cultivators. Finally, we measured member gratitude and entitlement behaviors at the same time as community commitment velocity. Future studies could either measure these constructs longitudinally, or use objective data to evaluate gratitude and entitlement behaviors at a later point to overcome potential concerns regarding reversed causality.<sup>4</sup>

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<sup>4</sup> We thank the associate editor and the anonymous reviewers for identifying this limitation and providing insightful directions for future research in this area.

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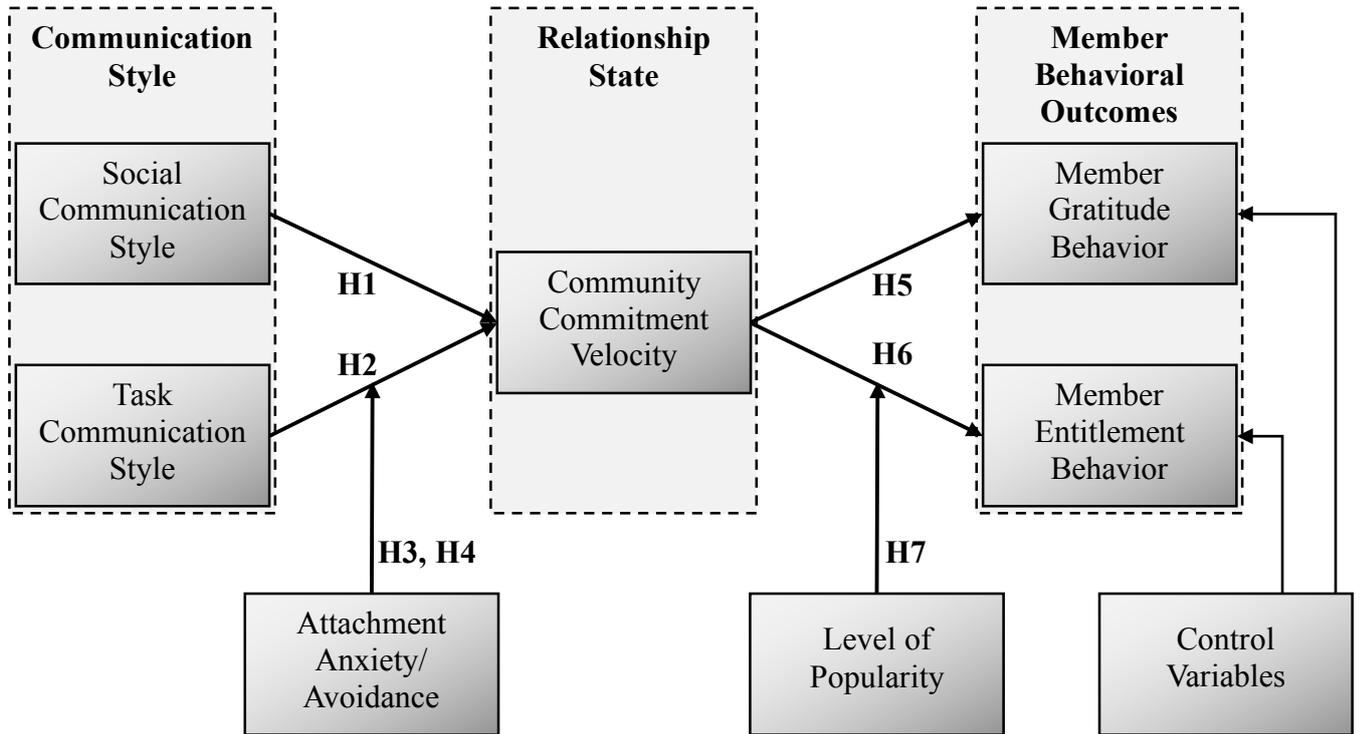
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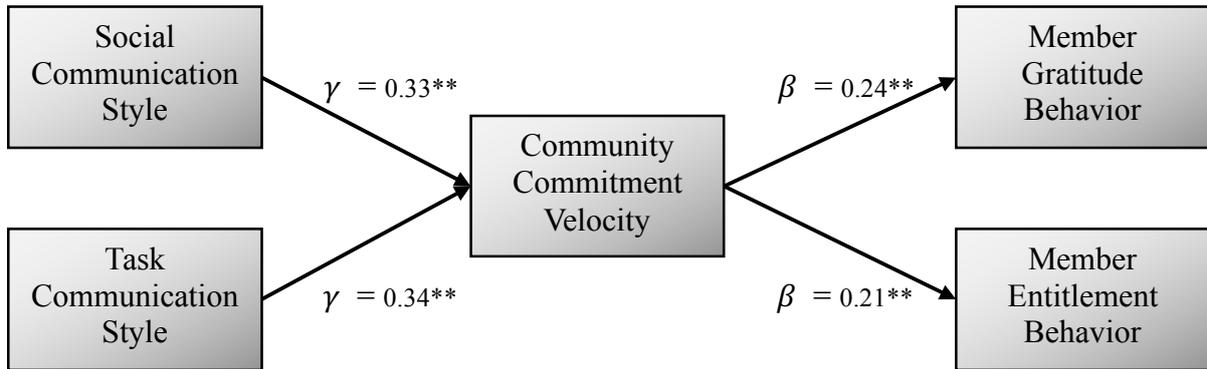
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**FIGURE 1**  
**Conceptual framework**



**FIGURE 2**  
**Standardized path coefficients for the model**



Note:

\*\* $p < 0.01$

**TABLE 1**  
**Measurement design**

Variable	Time 1	Time 2	Data Source
Social Communication Style	X		SRD
Task Communication Style	X		SRD
Attachment Anxiety	X		SRD
Attachment Avoidance	X		SRD
Community Commitment Velocity		X	SRD
Community Commitment Level		X	SRD
Member Gratitude Behavior		X	SRD
Member Entitlement Behavior		X	SRD
Level of Popularity			OD

Notes: We collected data at two time periods: Time 1 (initial) and Time 2 (one month after Time 1). SRD = self-reported survey data. OD = objective data

**TABLE 2**  
**Summary of measures**

Construct	Measures <sup>a</sup>	Standardized Factor Loadings <sup>b</sup>
<b>Social Communication Style</b> (CR = 0.92, AVE = 0.70)	1. Members were easy to talk with in [virtual community X].	0.85
	2. Members were interested in socializing with other members in [virtual community X].	0.82
	3. Members genuinely liked to help other members in [virtual community X].	0.90
	4. Members were cooperative and friendly in [virtual community X].	0.89
	5. Members tried to establish a personal relationship in [virtual community X].	0.71
<b>Task Communication Style</b> (CR = 0.90, AVE = 0.66)	1. Members worked hard to provide information in [virtual community X].	0.80
	2. Members were clearly goal oriented in [virtual community X].	0.79
	3. Members wanted [virtual community X] to be highly informative.	0.86
	4. Members' primary concern was to focus on the details of specific information in [virtual community X].	0.86
	5. Members' main objective was to provide practical information in [virtual community X].	0.73
<b>Community Commitment Velocity</b> (CR = 0.95, AVE = 0.87)	1. My relationship with [virtual community X] is improving.	0.96
	2. My relationship with [virtual community X] is getting worse over time. (reversed)	0.95
	3. My relationship with [virtual community X] is on a positive trajectory.	0.88
<b>Community Commitment Level</b> (CR = 0.89, AVE = 0.73)	1. I am willing to "go the extra mile" to interact with [virtual community X].	0.83
	2. I feel committed to the relationship with [virtual community X].	0.88
	3. In aggregate, I have a high caliber relationship with [virtual community X].	0.85
<b>Member Gratitude Behavior</b> (CR = 0.93, AVE = 0.82)	1. [Virtual community X] receives opportunities to earn additional contributions from me as payback for its past efforts.	0.90
	2. I contribute to [virtual community X] because I feel gratitude for its extra efforts.	0.92
	3. I give greater contributions to [virtual community X] because I owe it.	0.90
<b>Member Entitlement Behavior</b>	1. I claim significant effort from [virtual community X] because I deserve it.	0.83
	2. I demand the best possible level of help and support from [virtual community X] because I feel I	0.95

(CR = 0.92, AVE = 0.79)	am entitled to it.	
	3. I demand the best from [virtual community X] because I am worth it.	0.88
<b>Attachment Anxiety</b> (CR = 0.94, AVE = 0.78)	1. I worry about being abandoned by members in [virtual community X].	0.87
	2. Members in [virtual community X] change how they treat me for no apparent reason.	0.92
	3. I worry that [virtual community X] doesn't really like me as a member.	0.90
	4. I worry that [virtual community X] doesn't care about me as much as I care about it.	0.85
<b>Attachment Avoidance</b> (CR = 0.82, AVE = 0.55)	1. It is a comfortable feeling to depend on [virtual community X]. (reversed)	0.55
	2. I am comfortable having a close relationship with [virtual community X]. (reversed)	0.72
	3. It's easy for me to feel warm and friendly toward [virtual community X]. (reversed)	0.85
	4. It helps to turn to [virtual community X] in times of need. (reversed)	0.80
<sup>a</sup> All items were assessed on seven-point scales, anchored by 1 = Strongly disagree, and 7 = Strongly agree.		
<sup>b</sup> All factor loadings are significant at $p < 0.001$ .		
Notes: CR = Composite reliability; AVE = Average variance extracted.		

**TABLE 3**  
**Correlation matrix and summary statistics**

Variable	Correlation <sup>a</sup>											
	1	2	3	4	5	6	7	8	9	10	11	12
1. Social Communication Style	<b>0.84<sup>c</sup></b>											
2. Task Communication Style	0.70 (0.05) <sup>b</sup>	<b>0.81</b>										
3. Community Commitment Velocity	0.55 (0.05)	0.56 (0.05)	<b>0.93</b>									
4. Community Commitment Level	0.60 (0.05)	0.57 (0.05)	0.84 (0.06)	<b>0.85</b>								
5. Member Gratitude Behavior	0.51 (0.05)	0.50 (0.05)	0.67 (0.06)	0.76 (0.06)	<b>0.91</b>							
6. Member Entitlement Behavior	0.21 (0.04)	0.23 (0.04)	0.34 (0.05)	0.31 (0.04)	0.34 (0.04)	<b>0.89</b>						
7. Attachment Anxiety	-0.13 (0.04)	-0.10 (0.04)	-0.08 (0.05)	-0.07 (0.04)	0.04 (0.04)	0.21 (0.04)	<b>0.89</b>					
8. Attachment Avoidance	0.79 (0.05)	0.67 (0.04)	0.62 (0.04)	0.70 (0.04)	0.66 (0.04)	0.30 (0.03)	-0.17 (0.03)	<b>0.74</b>				
9. Community Type	0.12 (0.05)	0.17 (0.04)	0.12 (0.05)	0.16 (0.05)	0.12 (0.05)	-0.16 (0.04)	-0.10 (0.05)	0.11 (0.03)	--			
10. Gender	0.00 (0.05)	-0.01 (0.04)	0.08 (0.05)	0.00 (0.05)	0.11 (0.05)	0.04 (0.04)	0.01 (0.05)	0.00 (0.03)	-0.05 (0.05)	--		
11. Age	-0.07 (0.05)	0.01 (0.04)	-0.07 (0.05)	0.05 (0.05)	0.01 (0.05)	-0.12 (0.04)	-0.13 (0.05)	-0.02 (0.03)	0.00 (0.05)	-0.25 (0.05)	--	
12. Education	-0.06 (0.05)	-0.17 (0.04)	-0.12 (0.05)	-0.13 (0.05)	-0.14 (0.05)	-0.10 (0.04)	0.00 (0.05)	-0.18 (0.03)	0.10 (0.05)	-0.19 (0.05)	-0.16 (0.05)	--
Mean	5.78	5.88	5.51	5.77	5.31	4.09	2.85	5.40	N.A.	N.A.	35.53	N.A.
Standard Deviation	1.01	1.04	1.16	1.07	1.11	1.51	1.48	1.25	N.A.	N.A.	8.02	N.A.

Notes:

<sup>a</sup>All correlations are significantly less than 1.00.

<sup>b</sup>Standard errors appear in parentheses.

<sup>c</sup>The figures on the diagonal are the square roots of the average variance extracted score for each construct.

**TABLE 4**  
**Mediation tests**

Model	Added Path	Goodness-of-Fit	Tests of Hypotheses
M <sub>0</sub>	Baseline model: hypothesized paths	$\chi^2(268) = 1026.74, p = 0.00,$ RMSEA = 0.079, NNFI = 0.96, CFI = 0.96.	--
M <sub>1</sub>	Social Communication Style → Member Gratitude Behavior	$\chi^2(267) = 1025.48$	M <sub>0</sub> -M <sub>1</sub> : $\chi^2_d(1) = 1.26, p > 0.26$
M <sub>2</sub>	Social Communication Style → Member Entitlement Behavior	$\chi^2(267) = 1026.74$	M <sub>0</sub> -M <sub>2</sub> : $\chi^2_d(1) = 0.00, p > 0.99$
M <sub>3</sub>	Task Communication Style → Member Gratitude Behavior	$\chi^2(267) = 1025.01$	M <sub>0</sub> -M <sub>3</sub> : $\chi^2_d(1) = 1.73, p > 0.18$
M <sub>4</sub>	Task Communication Style → Member Entitlement Behavior	$\chi^2(267) = 1025.98$	M <sub>0</sub> -M <sub>4</sub> : $\chi^2_d(1) = 0.76, p > 0.38$

Notes: RMSEA = root mean squared error of approximation; NNFI = non-normed fit index; CFI = confirmatory fit index.

**TABLE 5**  
**Results for the moderating effects**

Main Effects		Attachment Anxiety High (N = 207)	Attachment Anxiety Low (N = 207)	Conclusion
		Standardized Coefficient ( <i>t</i> -value)	Standardized Coefficient ( <i>t</i> -value)	
H3	Task Communication Style →Community Commitment Velocity	0.68 (4.43)	0.15 (2.99)	Support H3 <sup>1</sup>
Main Effects		Attachment Avoidance High (N = 207)	Attachment Avoidance Low (N = 207)	Conclusion
		Standardized Coefficient ( <i>t</i> -value)	Standardized Coefficient ( <i>t</i> -value)	
H4	Task Communication Style →Community Commitment Velocity	0.61 (3.67)	0.06 (2.91)	Support H4 <sup>2</sup>
Main Effects		Level of Popularity High (N = 207)	Level of Popularity Low (N = 207)	Conclusion
		Standardized Coefficient ( <i>t</i> -value)	Standardized Coefficient ( <i>t</i> -value)	
H7	Community Commitment Velocity →Member Entitlement Behavior	0.55 (2.95)	0.07 (0.52)	Support H7 <sup>3</sup>

<sup>1</sup>Change is in positive direction and significant,  $\Delta\chi^2 = 10.78$ ,  $\Delta df = 1$ ,  $p < 0.01$ .

<sup>2</sup>Change is in positive direction and significant,  $\Delta\chi^2 = 12.16$ ,  $\Delta df = 1$ ,  $p < 0.01$ .

<sup>3</sup>Change is in positive direction and significant,  $\Delta\chi^2 = 4.56$ ,  $\Delta df = 1$ ,  $p < 0.05$ .

**APPENDIX:  $\chi^2$  Statistics regarding discriminant validity of factor pairs**

Construct	1 <sup>a</sup>	2	3	4	5	6	7
1. Social Communication Style							
2. Task Communication Style	$\chi^2_d(1)=$ 26.93						
3. Community Commitment Velocity	$\chi^2_d(1)=$ 26.63	$\chi^2_d(1)=$ 27.14					
4. Community Commitment Level	$\chi^2_d(1)=$ 28.16	$\chi^2_d(1)=$ 31.99	$\chi^2_d(1)=$ 5.45				
5. Member Gratitude Behavior	$\chi^2_d(1)=$ 40.05	$\chi^2_d(1)=$ 39.27	$\chi^2_d(1)=$ 12.33	$\chi^2_d(1)=$ 14.59			
6. Member Entitlement Behavior	$\chi^2_d(1)=$ 67.10	$\chi^2_d(1)=$ 55.22	$\chi^2_d(1)=$ 33.68	$\chi^2_d(1)=$ 50.15	$\chi^2_d(1)=$ 44.82		
7. Attachment Anxiety	$\chi^2_d(1)=$ 125.34	$\chi^2_d(1)=$ 107.36	$\chi^2_d(1)=$ 89.09	$\chi^2_d(1)=$ 98.40	$\chi^2_d(1)=$ 63.99	$\chi^2_d(1)=$ 65.99	
8. Attachment Avoidance	$\chi^2_d(1)=$ 30.93	$\chi^2_d(1)=$ 44.30	$\chi^2_d(1)=$ 42.88	$\chi^2_d(1)=$ 39.85	$\chi^2_d(1)=$ 43.31	$\chi^2_d(1)=$ 68.65	$\chi^2_d(1)=$ 154.71

<sup>a</sup>The difference in the chi-square values of the two models (i.e., the baseline and the constrained model), with one degree of freedom.